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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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HAT1127H

Silicon P Channel Power MOS FET Power Switching

REJ03G1330-0500

Rev.5.00

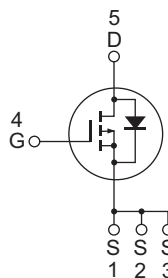
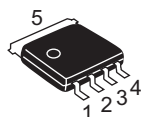
Jan 20, 2006

Features

- Capable of -4.5 V gate drive
- Low drive current
- High density mounting
- Ultra Low on-resistance
 $R_{DS(on)} = 3.6 \text{ m}\Omega$ typ. (at $V_{GS} = -10 \text{ V}$)

Outline

RENESAS Package code: PTZZ0005DA-A
(Package name: LFPAK)



1, 2, 3 Source
4 Gate
5 Drain

Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	-30	V
Gate to source voltage	V_{GSS}	-20/+10	V
Drain current	I_D	-40	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	-160	A
Body-drain diode reverse drain current	I_{DR}	-40	A
Channel dissipation	P_{ch} ^{Note2}	30	W
Channel to Case Thermal Impedance	θ_{ch-c} ^{Note2}	4.17	$^\circ\text{C/W}$
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes: 1. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$

2. $T_c = 25^\circ\text{C}$

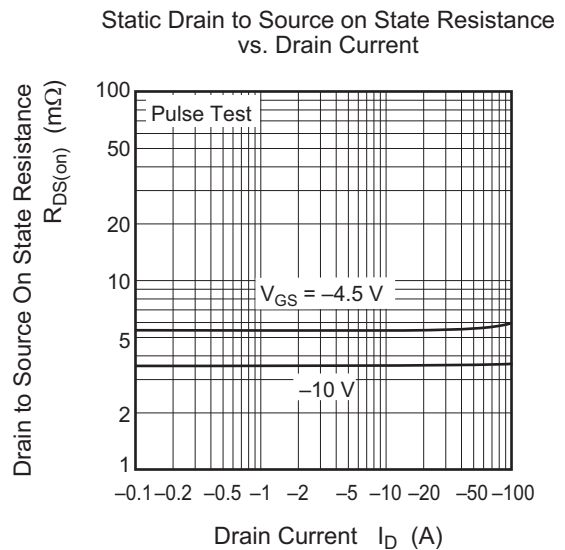
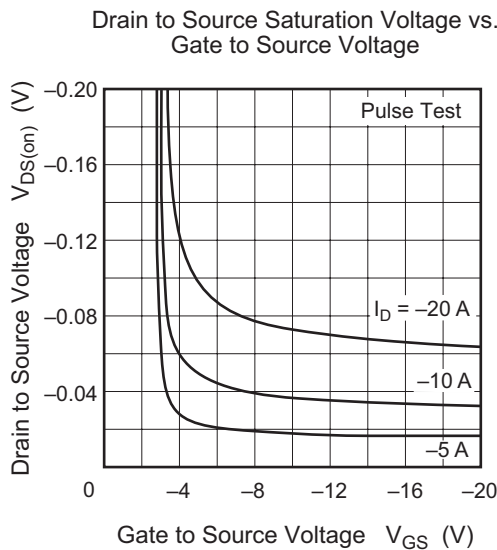
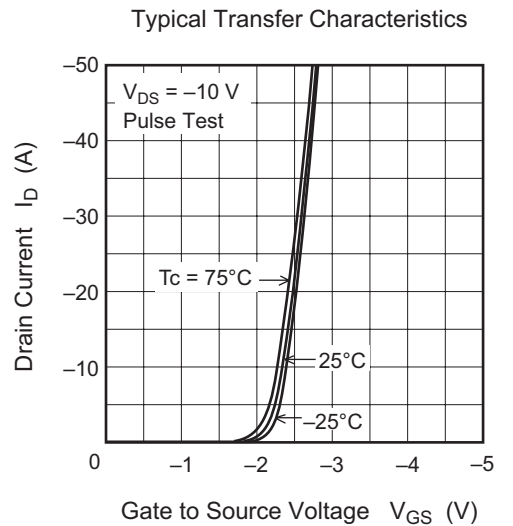
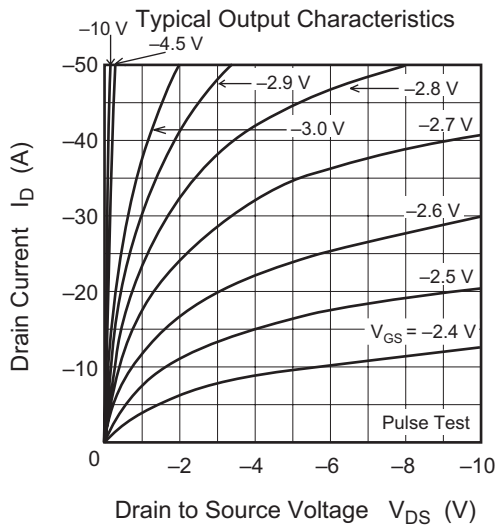
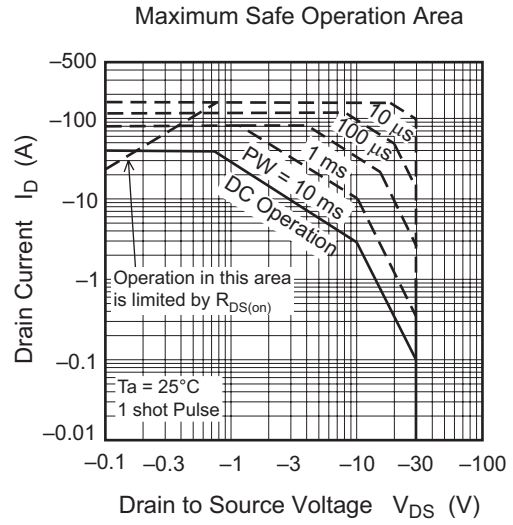
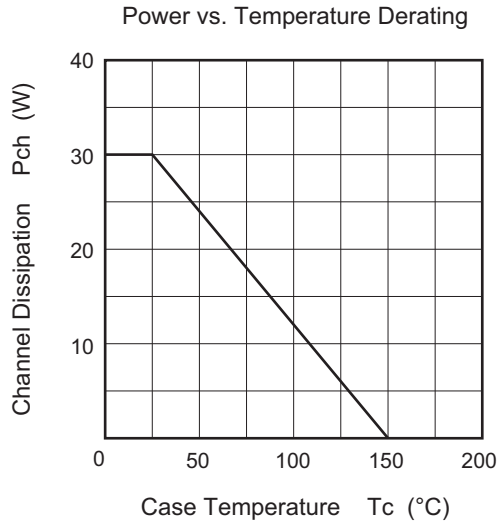
Electrical Characteristics

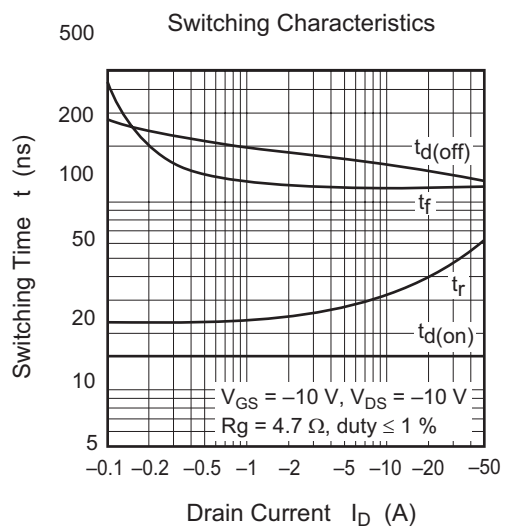
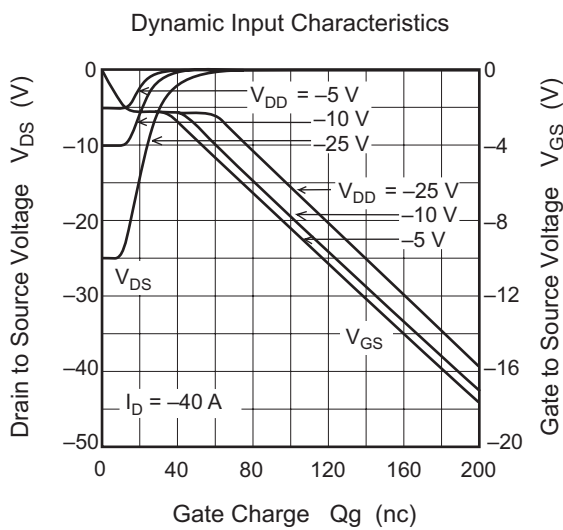
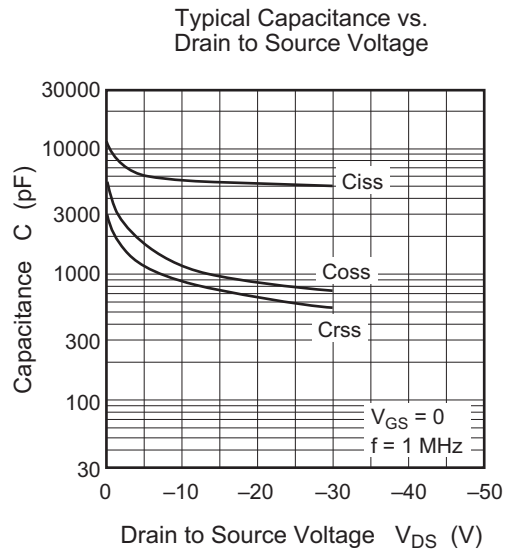
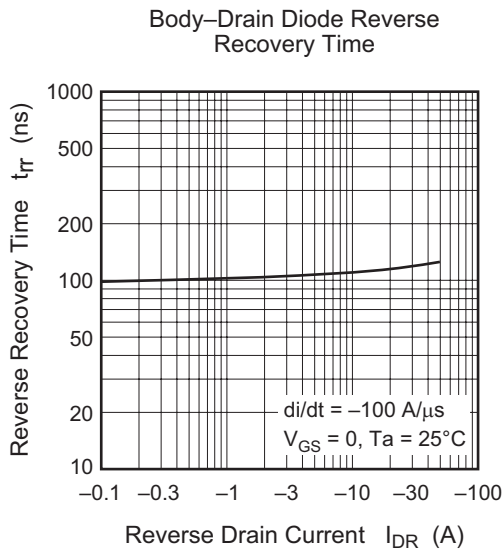
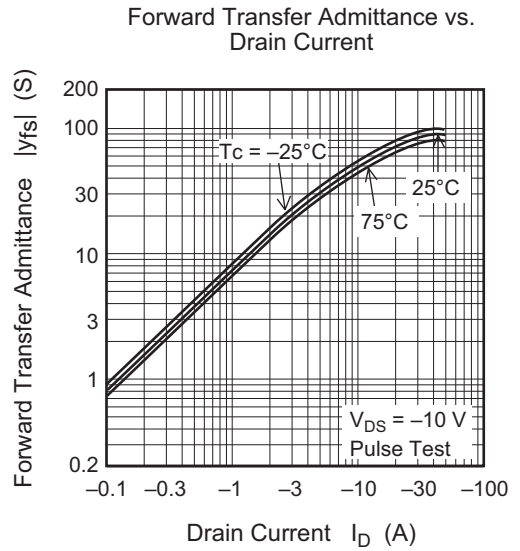
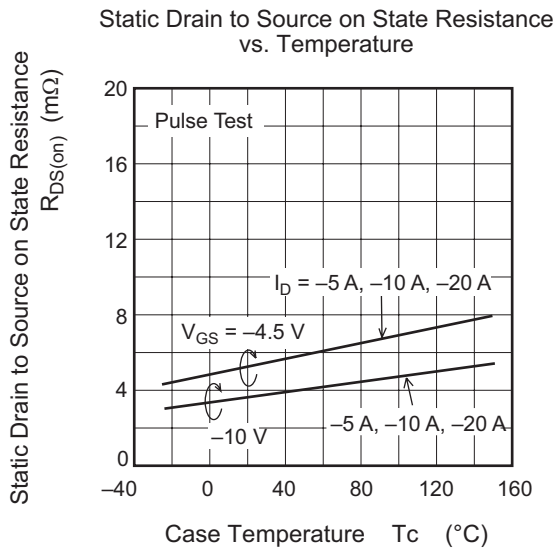
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-30	—	—	V	$I_D = -10 \text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = -20/+10 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	-1	μA	$V_{DS} = -30 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-1.0	—	-2.5	V	$V_{DS} = -10 \text{ V}$, $I_D = -1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	3.6	4.5	$\text{m}\Omega$	$I_D = -20 \text{ A}$, $V_{GS} = -10 \text{ V}$ ^{Note3}
	$R_{DS(on)}$	—	5.3	7.7	$\text{m}\Omega$	$I_D = -20 \text{ A}$, $V_{GS} = -4.5 \text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	40	70	—	S	$I_D = -20 \text{ A}$, $V_{DS} = -10 \text{ V}$ ^{Note3}
Input capacitance	C_{iss}	—	5600	—	pF	$V_{DS} = -10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	1180	—	pF	
Reverse transfer capacitance	C_{rss}	—	890	—	pF	
Total gate charge	Q_g	—	125	—	nC	$V_{DD} = -10 \text{ V}$, $V_{GS} = -10 \text{ V}$, $I_D = -40 \text{ A}$
Gate to source charge	Q_{gs}	—	15	—	nC	
Gate to drain charge	Q_{gd}	—	28	—	nC	
Turn-on delay time	$t_{d(on)}$	—	25	—	ns	$V_{GS} = -10 \text{ V}$, $I_D = -20 \text{ A}$, $V_{DD} \cong -10 \text{ V}$, $R_L = 0.5 \Omega$, $R_g = 4.7 \Omega$
Rise time	t_r	—	40	—	ns	
Turn-off delay time	$t_{d(off)}$	—	130	—	ns	
Fall time	t_f	—	115	—	ns	
Body-drain diode forward voltage	V_{DF}	—	-0.88	-1.15	V	$I_F = -40 \text{ A}$, $V_{GS} = 0$ ^{Note3}
Body-drain diode reverse recovery time	t_{rr}	—	120	—	ns	$I_F = -40 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

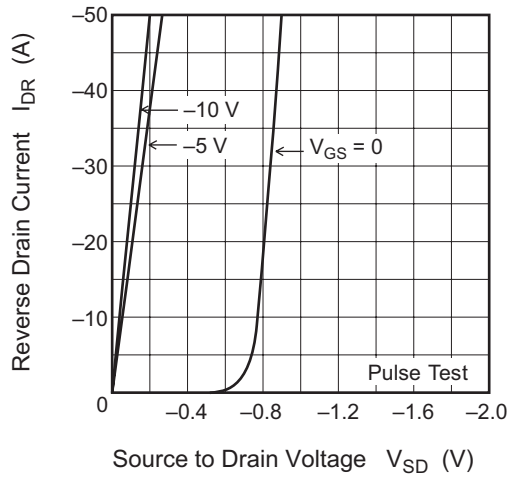
Notes: 3. Pulse test

Main Characteristics

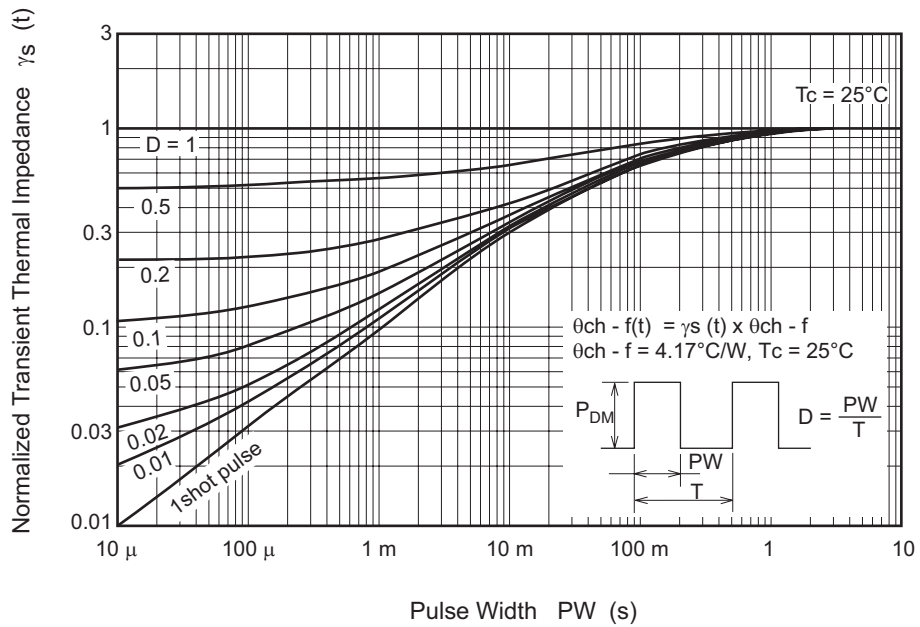




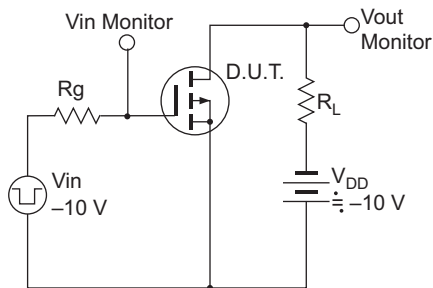
Reverse Drain Current vs. Source to Drain Voltage



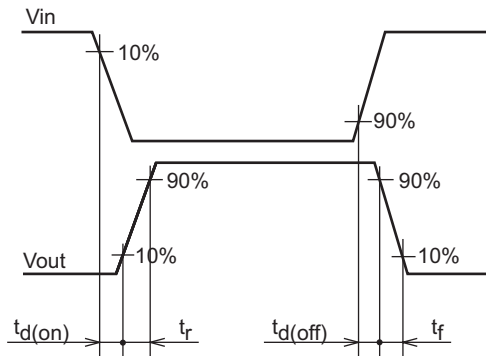
Normalized Transient Thermal Impedance vs. Pulse Width



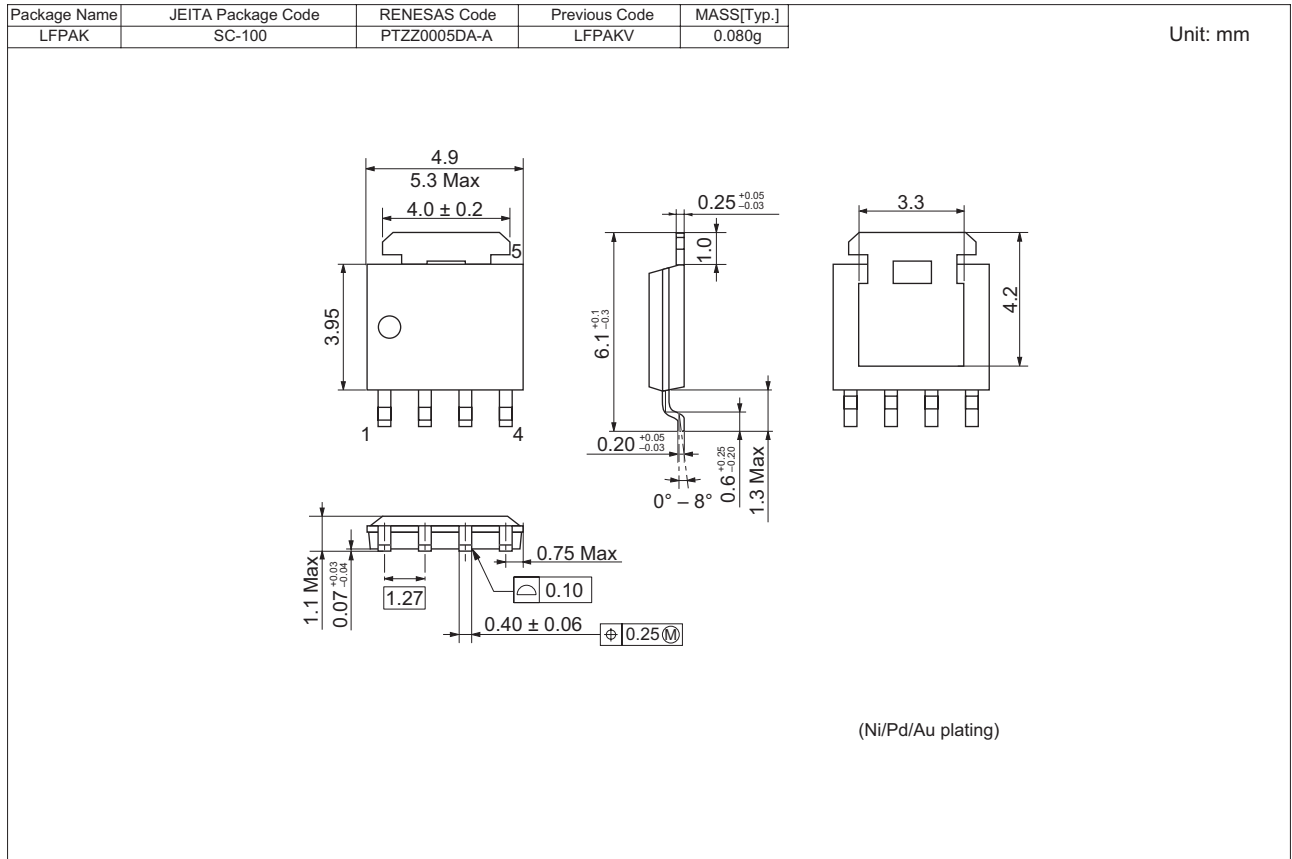
Switching Time Test Circuit



Waveform



Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
HAT1127H-EL-E	2500 pcs	Taping

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